

## CLAIMS

1           1.     A method for identifying, as friend or foe, a combat response unit having a  
2 helmet-mounted challenge receiver and retroreflector obturator, the method comprising the  
3 unordered steps of:

4           (a)     projecting an infrared (IR) transmit signal including a transmitted code of the  
5 day (TCOD) onto the combat response unit from a combat interrogatory unit;

6           (b)     receiving the IR transmit signal and TCOD at the challenge receiver;

7           (c)     selectively reflecting the IR transmit signal by opening and closing the  
8 retroreflector obturator according to a response code of the day (RCOD);

9           (d)     receiving the reflected IR transmit signal and RCOD at the combat the  
10 interrogatory unit; and

11           (e)     combining the received RCOD with the TCOD to identify the combat response  
12 unit as friend or foe.

1           2.     The method of claim 1 further comprising the steps of:

2           (f)     combining a first code of the day (COD) stored at the combat interrogatory unit  
3 with a randomly-generated number (RGN) to produce the TCOD; and

4           (g)     combining the received TCOD with a second COD stored at the combat  
5 response unit to produce the RCOD.

1           3.     The method of claim 2 further comprising the step of:

2           (h)     deactivating the combat response unit responsive to a doffing of the soldier's  
3 helmet.

1           4.     The method of claim 3 further comprising the step of:

2           (i)     accepting biometric data at the combat response unit; and

3           (j)     activating the combat response unit responsive to the biometric data.

1           5.       The method of claim 4 wherein the combat interrogatory unit includes a  
2 weapon-mounted interrogatory transceiver for projecting and receiving the IR transmit signal.

1           6.       The method of claim 5 further comprising the step of:  
2           (k)      generating an arrival quadrant signal representing the direction of arrival of the  
3 IR transmit signal at the combat response unit.

1           7.       The method of claim 1 further comprising the step of:  
2           (f)      deactivating the combat response unit responsive to a doffing of the soldier's  
3 helmet.

8.       The method of claim 1 further comprising the step of:  
(f)      accepting biometric data at the combat response unit; and  
(g)      activating the combat response unit responsive to the biometric data.

9.       The method of claim 1 wherein the combat interrogatory unit includes a  
weapon-mounted interrogatory transceiver for projecting and receiving the IR transmit signal.

10.      The method of claim 1 further comprising the step of:  
(f)      generating an arrival quadrant signal representing the direction of arrival of the  
IR transmit signal at the combat response unit.

11.      A system for combat identification as friend or foe (IFF) communications  
comprising:

a combat interrogatory unit comprising

projector means for projecting an infrared (IR) transmit signal including a  
transmitted code of the day (TCOD),

receiver means for receiving a reflected IR transmit signal including a response  
code of the day (RCOD), and

8 means for combining the received RCOD with the TCOD to identify the source  
9 of the reflected IR transmit signal as friend or foe; and  
10 a helmet-mounted combat response unit comprising  
11 sensor means for receiving a projected IR transmit signal including the TCOD,  
12 retroreflector means for reflecting an incoming IR transmit signal generally back  
13 along the incoming path thereof,  
14 obturator means for obstructing the retroreflector means to prevent reflection  
15 thereby, and  
16 means for opening and closing the obturator means according to the RCOD.

12. The system of claim 11 further comprising:  
in the combat interrogatory unit,  
means for combining a first stored code of the day (COD) with a randomly-generated  
number (RGN) to produce the TCOD; and  
in the helmet-mounted combat response unit,  
means for combining the received TCOD with a second stored COD to produce the  
RCOD.

13. The system of claim 12 further comprising:  
in the helmet-mounted combat response unit,  
means for deactivating the combat response unit responsive to a doffing of the helmet.

14. The system of claim 13 further comprising:  
in the helmet-mounted combat response unit,  
means for accepting biometric data at the combat response unit; and  
means for activating the combat response unit responsive to the biometric data.

15. The system of claim 14 further comprising:  
in the helmet-mounted combat response unit,

3 means for generating an arrival quadrant signal representing the direction of arrival of  
4 the IR transmit signal.

1 16. The system of claim 15 further comprising:  
2 in the combat interrogatory unit,  
3 means for fixing the projector means and the receiver means to a weapon.

1 17. The system of claim 11 further comprising:  
2 in the helmet-mounted combat response unit,  
3 means for deactivating the combat response unit responsive to a doffing of the helmet.

1 18. The system of claim 17 further comprising:  
2 in the helmet-mounted combat response unit,  
3 means for accepting biometric data at the combat response unit; and  
4 means for activating the combat response unit responsive to the biometric data.

1 19. The system of claim 18 further comprising:  
2 in the combat interrogatory unit,  
3 means for fixing the transmitter means and the receiver means to a weapon.

1 20. The system of claim 11 further comprising:  
2 in the helmet-mounted combat response unit,  
3 means for accepting biometric data at the combat response unit; and  
4 means for activating the combat response unit responsive to the biometric data.

1 21. The system of claim 11 further comprising:  
2 in the helmet-mounted combat response unit,  
3 means for generating an arrival quadrant signal representing the direction of arrival of  
4 the IR transmit signal.

1 22. The system of claim 11 further comprising:  
2 in the combat interrogatory unit,  
3 means for fixing the transmitter means and the receiver means to a weapon.

1 23. A combat response unit adapted for mounting in a helmet for use in a combat  
2 identification as friend or foe (IFF) communications system, the combat response unit  
3 comprising:

4 means for receiving a projected infrared (IR) transmit signal including a transmitted  
5 code of the day (TCOD);

6 retroreflector means for reflecting an incoming IR transmit signal generally back along  
7 the incoming path thereof;

8 obturator means for obstructing the retroreflector means to prevent reflection thereby;  
9 and

10 means for opening and closing the obturator means according to a response code of the  
11 day (RCOD).

12 24. The unit of claim 23 further comprising:  
2 means for combining the received TCOD with a second stored COD to produce the  
3 RCOD.

1 25. The unit of claim 24 further comprising:  
2 means for deactivating the combat response unit responsive to a doffing of the helmet.

1 26. The unit of claim 25 further comprising:  
2 means for accepting biometric data at the combat response unit; and  
3 means for activating the combat response unit responsive to the biometric data.

1 27. The unit of claim 23 further comprising:  
2 means for deactivating the combat response unit responsive to a doffing of the helmet.

1 28. The unit of claim 27 further comprising:  
2 means for accepting biometric data at the combat response unit; and  
3 means for activating the combat response unit responsive to the biometric data.

1 29. The unit of claim 23 further comprising:  
2 means for accepting biometric data at the combat response unit; and  
3 means for activating the combat response unit responsive to the biometric data.

1 30. The system of claim 23 further comprising:  
2 in the helmet-mounted combat response unit,  
3 means for generating an arrival quadrant signal representing the direction of arrival of  
4 the IR transmit signal.

1 31. A combat interrogatory unit for use in a combat identification as friend or foe  
2 (IFF) communications system, the combat interrogatory unit comprising:  
3 projector means for projecting an infrared (IR) transmit signal including a transmitted  
4 code of the day (TCOD);  
5 receiver means for receiving a reflected IR transmit signal including a response code  
6 of the day (RCOD); and  
7 means for combining the received RCOD with the TCOD to identify the source of the  
8 reflected IR transmit signal as friend or foe.

1 32. The unit of claim 31 further comprising:  
2 means for combining a first stored code of the day (COD) with a randomly-generated  
3 number (RGN) to produce the TCOD.

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33. The unit of claim 32 further comprising:  
means for fixing the projector means and the receiver means to a weapon.

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34. The unit of claim 31 further comprising:  
means for fixing the projector means and the receiver means to a weapon.

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